

REMARKS

The indication that claims 1-25 and 31 include patentable subject matter is acknowledged with thanks.

Claim 17 was rejected under §112, second paragraph, and has been amended as to form. The change was inadvertently omitted from the previous response. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 26-29 were rejected as unpatentable over WAN 6,060,336 or WAN 6,538,296 and claims 29-30 were rejected as unpatentable over SHAW et al. 5,426,070 in view of WAN '336. Claim 26 has been amended, claims 27-30 have been canceled, and new claims 32-35 have been added. Reconsideration and withdrawal of the rejections are respectfully requested for the reasons set forth below.

With regard to claims 26 and 32-34, the WAN patents disclose bonding of an IC wafer to another wafer with an adhesive layer. After further processing, the mono-crystalline structures are obtained. A difference between the device according to claim 26 and the device resulting from the process according to WAN is that the movable mechanical structure in the invention is a mirror, and in WAN it is an acceleration sensitive seismic mass. In order to obtain a good accelerometer one needs a "large proof mass from thick, low stress, mono-crystalline silicon" (column 3, lines 5-6), whereas for a Spatial Light Modulator as claimed, one wants the smallest possible mirrors which are not sensitive to

acceleration, i.e., as thin as possible. In order to be able to handle the wafers during the processing, one has to use "sacrificial substrate", i.e., a SOI wafer (Silicon On Insulator), which is thick and thus can be handled. After the bonding of the insulator is etched away, a consideration is that the resulting mirrors must exhibit a very high reflectivity, an issue that is not at all addressed in WAN, since the optical properties of the WAN device are not an issue.

Another difference is that the polymer adhesive used by WAN is not removed after final processing. Instead, WAN claims the epoxy adhesive as a feature of his invention, in that the epoxy has the function of "support members". The spacing provided by a polymer support member would change over time, a feature that is undesirable with mirrors.

With regard to claim 35, SHAW et al. describes only one etch method (SCREAM) for the manufacture of free-hanging mechanical structures that can be moved by means of electrostatic forces. However, the SCREAM process as such is not compatible with CMOS processed wafers because of the need for a high temperature (oxidation) step between the first Deep Reactive Ion etching step and the final isotropic DRIE step. To reverse the processing and begin with SCREAM and after that make the CMOS is not possible. It is not possible to understand how one would be able to combine the SCREAM process with the bonding method of WAN to make mirrors that are integrated with CMOS logic. If one

should use the SCREAM process for etching the mirrors and then bond to the CMOS wafer according to WAN with the etched side downwards, the mirror would constitute the non-planar lower surface of component 36 (see Fig. 1 in SHAW et al.), after having performed "sacrificial etching" of the "carrier wafer". However, it is not possible to use the lower surface of component 36 as a mirror because of the inferior reflectance thereof.

If on the other hand, should one attempt to turn the mirror wafer around in the bonding step, such that the planar "mirror" surface would face upwards, there will be the problem of connecting the mirrors to the CMOS, since an entire carrier wafer will be located between the CMOS interface and the mirror. Connections would have to be established through the wafer with some undisclosed (and non-obvious) method.

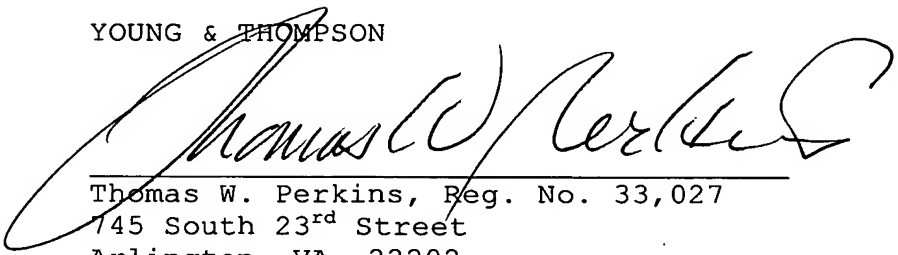
Thus, as can be seen, if the skilled man would try to attempt the teachings of SHAW et al. and WAN in combination, he would arrive at a non-operational device that still would have significant problems left to solve, which could not be done without inventive work.

In view of the present amendment and the foregoing remarks, it is believed that the present application has been placed in condition for allowance. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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